Valhalla

2575 A

AC-DC Current Shunt

Operation and Maintenance Manual

REV. 12/83

CERTIFICATION

VALHALLA SCIENTIFIC, INC. certifies that this instrument was thoroughly tested and inspected and found to meet its published specifications when it was shipped from the factory.

VALHALLA SCIENTIFIC, INC. further certifies that its calibration measurements are traceable to the National Bureau of Standards to the extent allowed by NBS's calibration facility.

WARRANTY

The warranty period for this instrument is stated on your invoice and packing list. Please refer to these to determine appropriate warranty dates.

We will repair or replace the instrument during the warranty period provided it is returned to VALHALLA SCIENTIFIC, INC. freight prepaid.

VALHALLA SCIENTIFIC, INC. is not liable for consequential damages. Permission and a return authorization number must be obtained directly from the factory for warranty repair returns. No liability will be accepted if units are returned without such permission.

SPECIFICATIONS

RANGE AND ACCURACY

RANGE	SHUNT VALUE	DC ACCURACY	AC ACCURACY 1KHz	AC ACCURACY 10KHz	MAX INPUT DC/RMS AC
100A	0.001Ω	±0.05%	±0.1%	*	100A
10A	0.01Ω	±0.02%	±0.1%	±0.5%	20A
1A	0.1Ω	±0.02%	±0.1%	±0.1%	2A
100mA	1Ω	±0.01%	±0.1%	±0.1%	0.2A
10mA	10Ω	±0.01%	±0.1%	±0.1%	0.02A
1mA	100Ω	±0.01%	±0.1%	±0.1%	0.002A

*Not Specified

AMPLFIER CHARACTERISTICS

Amplitude Gain:	10.000
Gain Accuracy:	±0.01% ±10 uV RTI at DC
Frequency Response:	±0.05% to 10 KHz
Input Resistance:	Greater than 10^{10} Ohms
Output Resistance:	Less than 1 Ohm
Maximum Input Voltage:	±0.3 VDC or Peak AC

GENERAL INFORMATION

Temperature Range:	0 to 50°C
Temperature Coefficient:	Less than 0.001% per°C
Shunt Voltage Drop:	100.00 mV for full scale input
Power:	115/230 VAC 50-60 Hz 12 Watts
	(230 VAC Special Order)
Size:	3.5"H x 17"W x 6"D
	8.9cm x 43.2cm x 15.2cm
Weight:	8 lbs. (3.6 Kg) Net
	13 lbs. (5.9 Kg) Shipping

TABLE OF CONTENTS

Section I	DESCRIPTION	1
Section II	INSTALLATION	1
Section III	OPERATION	1
Section IV	DISASSEMBLY	2
Section V	CALIBRATION	2
Section VI	DRAWINGS	4
Section VII	PARTS LIST	8

LIST OF ILLUSTRATIONS

Figure 1	SCHEMATIC	2575-070
Figure 2	MAIN BOARD ASSEMBLY	2575-600
Figure 3	CHASSIS ASSEMBLY	2575-400

SECTION 1 - DESCRIPTION

In the current measurement mode, the 2575 offers six isolated, switch-selectable decade ranges from 1 milliampere to 100 amperes full scale. Each shunt is a four-terminal non-inductive resistance element, insuring a flat frequency response. The three higher rated shunts are forced-air cooled to minimize temperature rise and maximize thermal stability.

The full scale voltage drop across any shunt is 100.00 millivolts at rated current. A buffer amplifier with a precision gain of 10.000 provides a higher level output which is capable of driving thermal transfer standards. The amplifier is available for use with external inputs. Its input impedance is 10,000 megohms.

When used as a set of laboratory standard resistors, the Model 2575 provides six decade value, four-terminal resistors from 0.001 ohm to 100 ohms. Each range is independently adjustable for ease of calibration at time of recertification.

SECTION II - INSTALLATION

The Model 2575 is normally produced for operation from 115 volt, 50-60 Hz power. When specified in the order, it will be provided for operation from 230 volt, 50-60 Hz power sources. Verify that the power requirements of the unit match the available power source before it is connected. When the Model 2575 is used as a bench-top instrument, no special installation procedures are required. If the "RX3" rack mount option is installed, the unit may be mounted in a standard 19 inch equipment rack. Whether used on a bench top or in an equipment rack, precautions must be taken to insure that there is no obstruction to airflow through the fan inlet and outlet. Also, when rack mounted, the ambient temperature must not exceed 50°C when the Model 2575 is in operation.

SECTION III - OPERATION

To measure the load current, connect the load in series with the front panel terminals of the appropriate current shunt. Note the maximum current limit labels on the panel. To obtain a low resistance connection to the 100 ampere terminals, high-current spade lugs should be attached to the connecting wires. Set the selector switch to the appropriate range Verify that an external input is not connected to the amplifier input terminals. Connect the measuring device (thermal transfer standard, DVM, etc.) to the output terminals, observing polarity (white terminal is positive). Note that the instrument output is limited to $\pm$ 10 milliamperes, maximum. The output of the instrument is linear and full scale output at rated current on any range is 1.0000 volt $\pm$ 0.01%.

It is not necessary that a load connected to one range be disconnected when connecting a load to another range as the selector switch isolates the shunts from one another.

The instrument may be used as an amplifier with a precision gain of 10.000 and 10,000 megohms input impedance over the range of DC to 10 KHz. To use this capability, place the selector switch in the EXT position. Connect the input signal to the amplifier input terminals, observing polarity. Note that the maximum input level is 200 millivolts. The amplifier is linear over the range of DC to 10 KHz and the full scale output is 1.0000 volt ± 0.01% for an input level of 100 millivolts.

SECTION IV - DISASSEMBLY

It will be necessary to remove the covers of the instrument to gain access to the calibration adjustments. Covers are removed by removing four screws through the top rear bezel and then lifting the cover clear.

The front panel circuit board, to which the amplifier and lower rated shunt resistors are mounted, must be removed to remove and replace components or to replace a front panel terminal. The board is attached to the front panel by nuts threaded on the front panel terminals which must be removed to remove the board. The washers under the nuts should be replaced when replacing the board and the nuts tightened securely, since they provide the connection between the terminal and the shunt.

SECTION V - CALIBRATION

The Model 2575 should be calibrated, at intervals best determined by the user, with the following procedure. Calibration requires a digital voltmeter with a DC accuracy of 0.005% on the 100 millivolt and 1 volt ranges (Guildline Model 9574, or equivalent) and a current calibrator with current ranges of 100, 10, 1, 0.1, and 0.001 amperes (Valhalla Model 2555A, or equivalent). An alternate to the following calibration procedure is return of the instrument to Valhalla where calibration instruments with accuracies traceable to the U.S. Bureau of Standards are available. Refer to Section IV for removal of covers for access to adjustments.

1. Connect the digital voltmeter to the amplifier input terminals of the Model 2575. Select its 100 millivolt range and allow the manufacturer's recommended time for stabilization after applying power.

2. Place the selector switch in the 100A position.

3 Connect the current calibrator output to the 100A range terminals using high current spade lugs. Set the current calibrator output for 100 amperes and adjust RV1 (see Figure 1) to provide a DVM reading of 100.00 millivolts ± 50 microvolts.

4. Place the selector switch in the 10A position.

5. Connect the current calibrator output to the 10A range terminals. Set the current calibrator output for 10 amperes and adjust RV2 (see Figure 1) to provide a DVM reading of 100.00 millivolts ± 20 microvolts.

6. Place the selector switch in the 1A position.

7. Connect the current calibrator output to the 1A range terminals. Set the current calibrator output for 1 ampere and adjust RV3 (see Figure 1) to provide a DVM reading of 100.00 millivolts ± 20 microvolts.

8. Set the selector switch to the 100mA range.

9. Connect the current calibrator output to the 100mA range terminals. Set the current calibrator output for 100 milliamperes and adjust RV4 for a DVM reading of 100.00 millivolts ± 10 microvolts.

10. Set the selector switch to the 10mA range.

11. Connect the current calibrator output to the 10mA range terminals. Set the current calibrator output for 10 milliamperes and adjust RV5 for a DVM reading of 100.00 millivolts ± 10 microvolts.

12. Set the selector switch to the 1mA range.

13. Connect the current calibrator output to the 1mA range terminals. Set the current calibrator output for 1 milliamperes and adjust RV6 for a DVM reading of 100.00 millivolts ± 10 microvolts.

14. Repeat the above sequence at 1 KHz for the 100A and 10A ranges and 10 KHz for the 1mA through the 10A ranges to verify AC performance.

15. Set the selector switch to the EXT position.

16. Apply 100mV ± 5 microvolts to the amplifier input terminals. Monitor the amplifier output terminals with the DVM and adjust RV7 for a reding of 1.0000V ± 100 microvolts.

17. Disconnect all equipment. Calibration is now complete.

Valhalla Scientific Inc. | **PARTS LIST** | CHASSIS A. MBLY | MODEL 2575A | DWG # 2575 00 | REV H

#	REF DES	VALHALLA PART NO	DESCRIPTION	CODE IDENT	MFG PART NO	I	N	I	N		REMARKS
1											
2			CHASSIS ASSY	53504	2575-400	X					
3											
4			MAIN P.C.B. ASSY	53504	2575-600	1					
5		5-10385	BINDING POST ASY	53504	2575-401	2					(1)4-10200 Required in each assembly
6			SHUNT ASSY	53504	2575-402	1					
7											
8		4-10460	SIDE RAIL	53504	2790-206	2					
9		4-10333	BEZEL	53504	2724-205	4					
10		4-10276	TOP & BOTTOM COVERS	53504	2714-204	2					
11		4-10346	SUPPORT BAR	53504	2300-214	2					
12		4-10332	CORNER BLOCK	53504	2724-204	4					
13		4-10425	REAR PANEL	53504	2575-200	1					
14		4-10426	SHUNT SUPPORT	53504	2575-201	1					
15		4-10465	FRONT PANEL	53504	2575-204	1					
16		4-10428	POWER SUPPLY PLATE	53504	2575-215	1					
17											
18		5-10391	POWER SUPPLY +15V-15V	~~POWER-~~ MATE	ETA-12/153	1					
19		5-03061	SWITCH POWER	SCHADOW	ZFNE15	1					
20		5-03017	SWITCH/SLIDE 115/220	82389	46256LFR	1					
21		5-10018	FUSE HOLDER	75915	342004A						
22		5-04010	FUSE .25AMP Slo Blo	75915							
23		5-10063	CONNECTOR POWER CORD	82389	EAC301	1					

NOTES: SHTS. 4 & 5 ARE ASSY. DWG.

Valhalla Scientific Inc. | PARTS LIST | MAIN BD. ASSEMBLY | CODE 2575 | DWG NO 2575-00 | REV E

#	REF DES	VALHALLA PART NO	DESCRIPTION	CODE IDENT	MFG PART NO	I	N	I	N		REMARKS
1											
2			MAIN BD. ASSEMBLY	53504	2575-600	X					
3											
4		4-30035	MAIN BOARD	53504	2575-700C	1					
5											
6	C1, 2	2-50001	CAP., .1µf, POLY	05396	PD5B104	2					
7	C3, 4, 5, & 6	2-10006	CAP., 01µF, CERAMIC 50V	SPRAGUE	8121-050-651-103M	4					
8											
9	IC1	3-30111	OP AMP	27014	ICL7650CPD	1					
10	IC2	3-30168	VOLTAGE REG +5	NAT.	LM340LAZ-5.0	1					
11	IC3	3-30169	VOLTAGE REG -5	NAT.	LM320L2-5.0	1					
12											
13	R1, 2, & 3		FACTORY SELECT			3					
14	R4, 5, 6 & 14	1-20016	RES, 1K, WW.	53504	1-20016	4					
15	R7	1-20022	RES, 1.01Ω, 1%	53504	1-20022	1					
16	R8	1-10032	RES, 69.8Ω, 1%	81349	RN60C69R8F	1					
17	R9	1-20063	RES, 10.1Ω, WW	53504	1-20063	1					
18	R10	1-10014	RES, 698Ω, 1%	81349	RN60C6980F	1					
19	R11	1-20064	RES, 101Ω, WW	53504	1-20064	1					
20	R12	1-10035	RES, 6.98K, 1%	81349	RN60C6981F	1					
21	R13	1-01041	RES, 1K, ¼W, 5%	81349	RC07GF102J	1					
22	R15	1-20011	RES, 8.975K, WW	53504	1-20011	1					
23	R16	1-01007	RES, 10Ω, ¼W, 5%	81349	RC07GF100J	1					

NOTES: SHT. 3 OF 3 IS ASSY DWG.

Valhalla Scientific Inc.	PARTS LIST	MAIN ASSY.	MODEL 2575	DWG NO 257[illegible] 00	REV E

#	REF DES	VALHALLA PART NO	DESCRIPTION	CODE IDENT	MFG PART NO	I	N	I	N		REMARKS
24											
25	RV1 2 & 3	1-50018	RES, VARIABLE 10 Ω	73138	68WR-10Ω	3					
26	RV4	1-50014	RES, VARIABLE 100 Ω	73138	68WR-100Ω	1					
27	RV5	1-50013	RES, VARIABLE 1K	73138	68WR-1K	1					
28	RV6	1-50012	RES, VARIABLE 10K	73138	68WR-10K	1					
29	RV7	1-50033	RES, VARIABLE 50 Ω	73138	68WR-50Ω	1					
30											
31	SW1	5-03031	SWITCH ROTARY	71590	SA-203-3F-000	1					
32											
33			WIRE, WHT, 22AWG		16" WHT	1					
34			WIRE, RED, 22AWG		16" RED	1					
35			WIRE, BLK, 22AWG		16" BLK	1					
36			WIRE, BLUE, 22AWG		8" BLUE	1					
37			WIRE, GRN, 22AWG		8" GRN	1					
38			WIRE, YEL, 22AWG		8" YEL	1					
39			WIRE, ORN, 22AWG		8" ORN	1					
40											
41	E1-G, 21-23	5-10330	BEAD PIN	27264	RG2-3	15					
42											
43											
44											
45											
46											

NOTES:

Valhalla Scientific Inc. | PARTS LIST | CHASSIS SEMBLY | DE 2575A | DWG O 2575 0 | H

#	REF DES	VALHALLA PART NO	DESCRIPTION	CODE IDENT	MFG PART NO	I	N	I	N		REMARKS
24		5-10067	POWER CORD	70903	17250	1					
25		5-10015	FEET RUBBER WHITE	ACCURATE	2084W/467WHT	4					
26		5-1 0389	fan,115V,50/60Hz	MICRONEL	V624L 115A	1					
27		5-10390	FAN GUARD	MICRONEL	V600	1					
28	C7	2-80005	CAP.,2.7$_{\mu}$f, MYLAR	MEPCO	713AIRR275PK1015N	1					
29	TB1	5-10050	TERMINAL BOARD 5 pos	83330	3005	1					
30		5-10102	BINDING POST, WHT	83330	257-WHT	5					
31		5-10021	BINDING POST, RED	83330	257-RED	5					
32		5-10002	BINDING POST, WHT	83330	1517-WHT	2					
33		5-10164	BINDING POST, BLUE	83330	1517-BLU	2					
34		5-10153	KNOB, BLACK	Kurz Kasch	76-18	2					
35		5-10202	KNOB COLLET BLK			1					
36		5-10203	SKIRT POINTER BLK			1					
37		5-10101	SPACER 3/8 Rd. #6	83330	2101	4					
38			SCREW PHIL PAN STAIN		6-32x 3/4	4					
39			SCREW PHIL PAN STAIN		6-32x7/16	6					
40			SCREW PHIL PAN STAIN		6-32x5/8	4					
41			SCREW PHIL PAN STAIN		6-32x3/8	18					
42			SCREW PHIL FLAT STAIN		6-32x3/8	12					
43			SCREW PHIL PAN STAIN		4-40x3/8	10					
44			SCREW PHIL PAN STAIN		4-40x9/16	4					
45			SCREW PHIL FLAT STAIN		6-32x1/2	8					
46			STUD BRASS 3/4" Lg.		1/4-20UNC-2A	2					

NOTES:

Valhalla Scientific Inc.	PARTS LIST	CHASSIS A' 'MBLY	MODEL 2575A	DWG NO 2575=)	REV H

#	REF DES	VALHALLA PART NO	DESCRIPTION	CODE IDENT	MFG PART NO	I	N	I	N		REMARKS
47			WASHER, FLAT		#4	10					
28			WASHER, SPLIT LOCK		#4	16					
49			WASHER FLAT		#6	12					
50			WASHER, SPLIT LOCK		#6	27					
51			WASHER FLAT		1/4"	4					
52			WASHER SPLIT LOCK		1/4"	2					
53			WASHER, FLAT, BRASS		1/4" BRASS	2					
54		5-10086	WASHER, GND LUG #6	83330	1412-6	1					
55			WASHER INTERNAL STAR		#6	2					
56			NUT, RADIO HEX		4-40	18					
57			NUT, RADIO HEX		6-32	8					
58			NUT, HEX BRASS		1/4-20UNC-2B	4					
59			LUG RING, #6 16-18AWG		#6 16-18AWG	5					
60			WIRE RED 18AWG		18", 18AWG	1					
61			WIRE BLK 18AWG		20",18AWG	1					
62			WIRE BRN 18AWG		30", 18AWG	1					
63			WIRE ORN 18AWG		30", 18AWG	1					
64			WIRE WHT 18AWG		18", 18AWG	1					
65			WIRE YEL 18AWG		12", 18AWG	1					
66											
67		5-10331	CLASPCON SOCKET	27264	02-06-1103	3					
68			SHRINK TUBING 1/4" BLK		1/4" BLK 1 ft.	1					
69			LOCK-TITE			A/R					

NOTES:

Valhalla Scientific Inc. | **PARTS LIST** | CHASSIS SEMBLY | CODE 2575A | DW O 257 00

#	REF DES	VALHALLA PART NO	DESCRIPTION	CODE IDENT	MFG PART NO	I	N	I	N		REMARKS
70		5-10436	STANDOFF 1/4 HEXx7/16LG		6-32 THD MF	2					
71			SCREW, PHIL PAN BLK		6-32x1/4 LG	2					
72			WASHER, INT STAR #6			2					

NOTES:

Valhalla Scientific Inc. | **PARTS LIST** | SHUNT ASSEMBLY | MODEL 2575A | DWG NO 2575-02 | REV B

#	REF DES	VALHALLA PART NO	DESCRIPTION	CODE IDENT	MFG PART NO	I	N	I	N		REMARKS
1											
2			SHUNT ASSEMBLY	53504	2575-402	X					
3											
4		4-10294	HEAT SINK, SHUNT	53504	2300-205	1					
5		4-10295	PLATE, SHUNT	53504	2300-206	1					
6		4-10427	BUS BAR	53504	2575-202	2					
7											
8	R17	1-20108	SHUNT STOCK, 100 AMP	53504	2300-207	1					
9	R18	1-20116	SHUNT STOCK, 20 AMP	53504	2100-204	1					
10	R10	1-20120	SHUNT STOCK, 2 AMP	53504	2575-205	1					
11											
12		5-10303	INSULATOR, TOP	53504	2300-218	1					
13		5-10305	INSULATOR, BOTTOM	53504	2300-220	1					
14		5-10387	INSULATOR INNER 100 AMP	53504	2575-206	1					
15		5-10236	INSULATOR INNER 20 AMP	53504	2100-206	2					
16		5-10331	CLASPCON SOCKET	27264	02-06-1103	6					
17		5-10388	STANDOFF MALE FEMALE	83330	8253	4					
18		5-10227	SPACER NYLON .047THK	KEYSTONE	346	5					
19		5-10162	SHOULDER WASHER	83330	2150	6					
20			WASHER SPLIT LOCK	81349	#6	7					
21			SCREW PHIL PAN STAIN	81349	6-32x5/8	3					
22			LUG RING 16 AWG #10	81349	#10 14-16AWG	2					
23			LUG RING 22 AWG #10	81349	#10 18-22 AWG	2					

NOTES:

Valhalla Scientific Inc | PARTS LIST | SHUNT A MBLY | DE[illegible] 2575A | [illegible]SWG 2575-4 | B

#	REF DES	VALHALLA PART NO	DESCRIPTION	CODE IDENT	MFG PART NO	I	N	I	N		REMARKS
24											
25			WIRE, BLUE, 22 AWG		14" 22 AWG	1					
26			WIRE, GRN, 22 AWG		6" 22 AWG	1					
27			WIRE, WHT, 20 AWG		4" 20 AWG	1					
28			WIRE, ORN, 20 AWG		4" 20 AWG	1					
29			WIRE, BLK, 16 AWG		4" 16 AWG	1					
30			WIRE, RED, 16 AWG		4" 16 AWG	1					
31											
32			WIRE COAX		14" RG174/U	1					
33											
34			SHRINK TUBING 3/16" dia		12", 3/16" DIA. BLK	1					
35											
36		5-10019	TIES, CABLE 3½" LG.		WRN 3½	6					
37											
38			NUT, RADIO HEX		6-32	3					
39											
40											

NOTES:

VALHALLA SCIENTIFIC 2575A
CALIBRATION ID # _____

DATE_____ CODE # _____ TECH. _____

REFERENCE VALHALLA SCIENTIFIC MODEL 2575A MANUAL (PAGES 2 TO 3)

STEP 1 CHECK THEN ADJUST **RV1** 100A RANGE (STEP 1,2 AND 3)

BEFORE ADJUSTING _____ AFTER ADJUSTING _____

STEP 2 CHECK THEN ADJUST **RV2** 10 A RANGE (STEP 4 AND 5)

BEFORE ADJUSTING _____ AFTER ADJUSTING _____

STEP 3 CHECK THEN ADJUST **RV3** 1 A RANGE (STEP 6 AND 7)

BEFORE ADJUSTING _____ AFTER ADJUSTING _____

STEP 4 CHECK THEN ADJUST **RV4** .1 A RANGE (STEP 8 AND 9)

BEFORE ADJUSTING _____ AFTER ADJUSTING _____

STEP 5 CHECK THEN ADJUST **RV5** 10 mA RANGE (STEP 10 AND 11)

BEFORE ADJUSTING _____ AFTER ADJUSTING _____

STEP 6 CHECK THEN ADJUST **RV6** 1 mA RANGE (STEP 12 AND 13)

BEFORE ADJUSTING _____ AFTER ADJUSTING _____

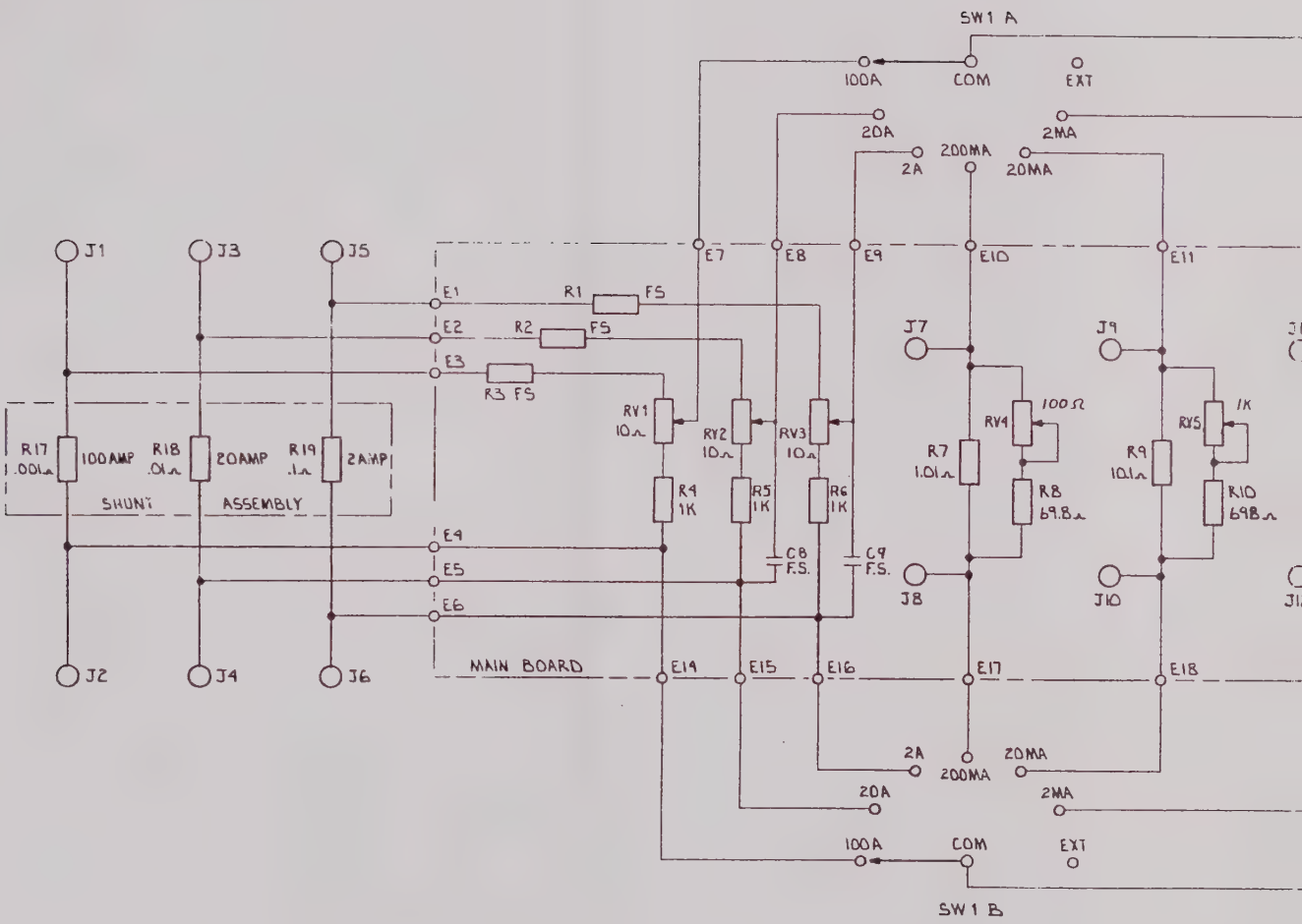
STEP 7 REPEAT THE ABOVE SEQUENCE AT 1 KHz FOR THE 100A AND 10A RANGES AND 10 KHz FOR 1 mA THROUGH THE 10 A RANGES TO VERIFY AC PERFORMANCE .

STEP 8 SELECT EXT POSITION AND APPLY 100mV $\pm$ 5 uV TO AMPLIFIER INPUT TERMINALS. MONITOR OUTPUT AND ADJUST **RV7** FOR A READING OF 1.0000V $\pm$ 100 uV.

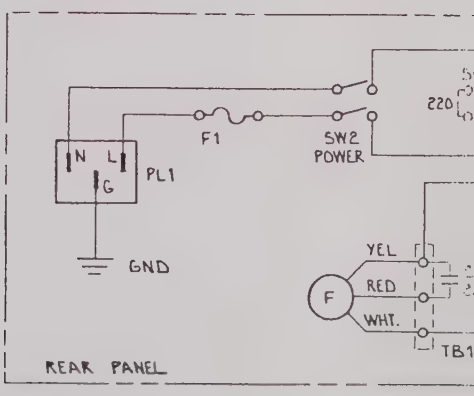
BEFORE ADJUSTING _____ AFTER ADJUSTING _____

NOTES: UNLESS OTHERWISE SPECIFIED

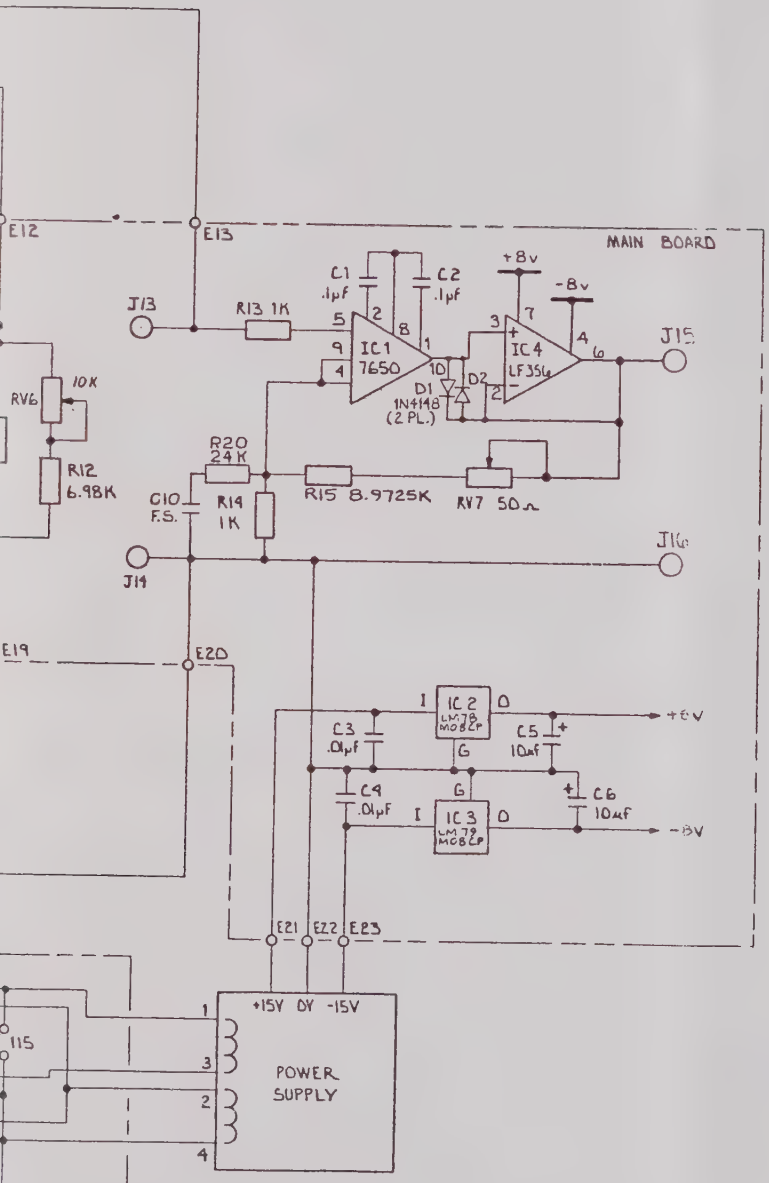
1. J1 THRU J16 ARE MOUNTED ON FRONT PANEL



POWER CONNECTIONS		
IC #	-8V	+8V
1	7	11

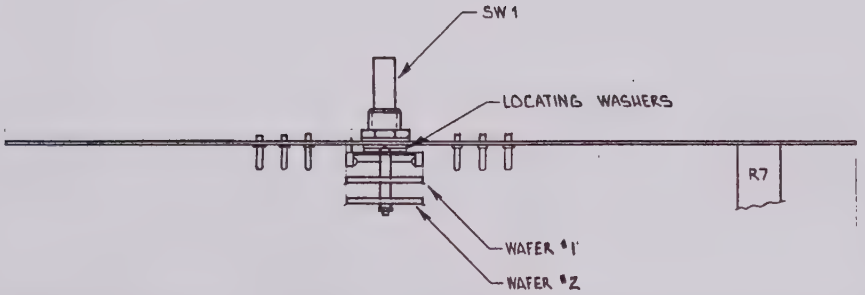


ECO	LTR	DESCRIPTION	DATE	APPR
	B	REDESIGNED SEE OBSOLETE DRAWING FOR A REV. 6-24-83 CL	6-28-83	PW
193	C	2A & 100A LINES REVERSED	12-6-83	
393	D	ADD R17, 820Ω, CHG 5V TO 8V REG	3-23-84	R
533	E	ADDED IC2 & DELETED R5 & R6 WPW	10-22-84	JM
565	F	ADDED D1 & D2 DPM	2-4-85	



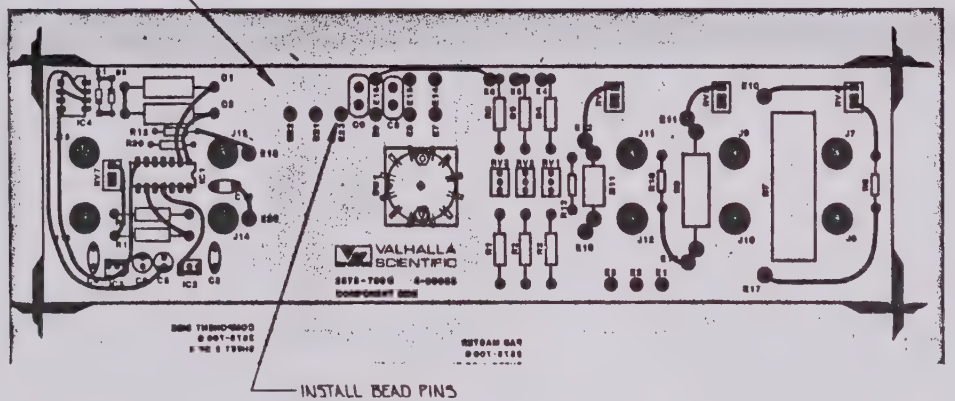
				TOLERANCES X = ± 30' .XX = ± .03 .XXX = ± .010	MATERIAL	DRAWN CRL 6 24 83	Valhalla Scientific Inc SAN DIEGO, CA
						CHECKED PW 6-28-83	
						APPR PW 6-28-83	
						STK NO	
				BREAK AL. SHARP CORNERS AND EDGES. MACH SURFACES 64	FINISH		SCHEMATIC 2575
DASH NO	QTY REQD	NEXT ASSEMBLY	USED ON			SCALE	CODE IDENT 53504 / SIZE D / DRAWING NO 2575-070 / RE I
						SHEET 1 OF 1	

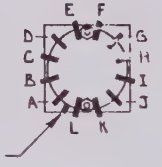
REVISIONS				
ECO	LTR	DESCRIPTION	DATE	APPROVED
	C	RESTYLED W.P.W. 7-22-83	8/5/83	PW
0166	E	SEE ECR 0166 C.R.E.	11-11-83	PW.
386	F	PARTS LIST CHANGE RDN	3-21-84	RN
393	G	ADD C8 - C10, R20 - REDRAWN R	4-2-84	R
533	H	ADDED IC4 WPW	8-27-84	R
565	I	ADD D1 & D2 DPM	2-11-85	PW
682	J	CHANGE STOCK #'S ON C1+2 C.R.E.	4-1-85	PW

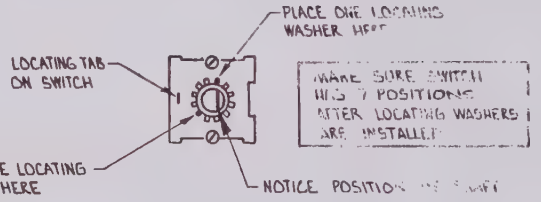


WIRING FOR SW1

FROM		TO
WAFER	1 WIPER	E13
WAFER	1 D	E7
WAFER	1 E	E8
WAFER	1 F	E9
WAFER	1 G	E10
WAFER	1 H	E11
WAFER	1 I	E12
WAFER	2 WIPER	E20
WAFER	2 D	E14
WAFER	2 E	E15
WAFER	2 F	E16
WAFER	2 G	E17
WAFER	2 H	E18
WAFER	2 I	E19






PLACE ONE LOCATING WASHER HERE
LOCATING TAB ON SWITCH
MAKE SURE SWITCH HAS 7 POSITIONS AFTER LOCATING WASHERS ARE INSTALLED
PLACE ONE LOCATING WASHER HERE
NOTICE POSITION

DASH NO	QTY REQD	NEXT ASSEMBLY	USED ON
	1	2575-400	2575A

TOLERANCES: X° = ± 30' .XX = ± .03 .XXX = ± .010

MATERIAL

BREAK ALL SHARP CORNERS AND EDGES, MACH SURFACES 64

FINISH

DRAWN C.R.E. 7/15/83
CHECKED R.J 8/2/83
APPR P.W 8/5/83
STK NO

Valhalla Scientific Inc.
SAN DIEGO, CA

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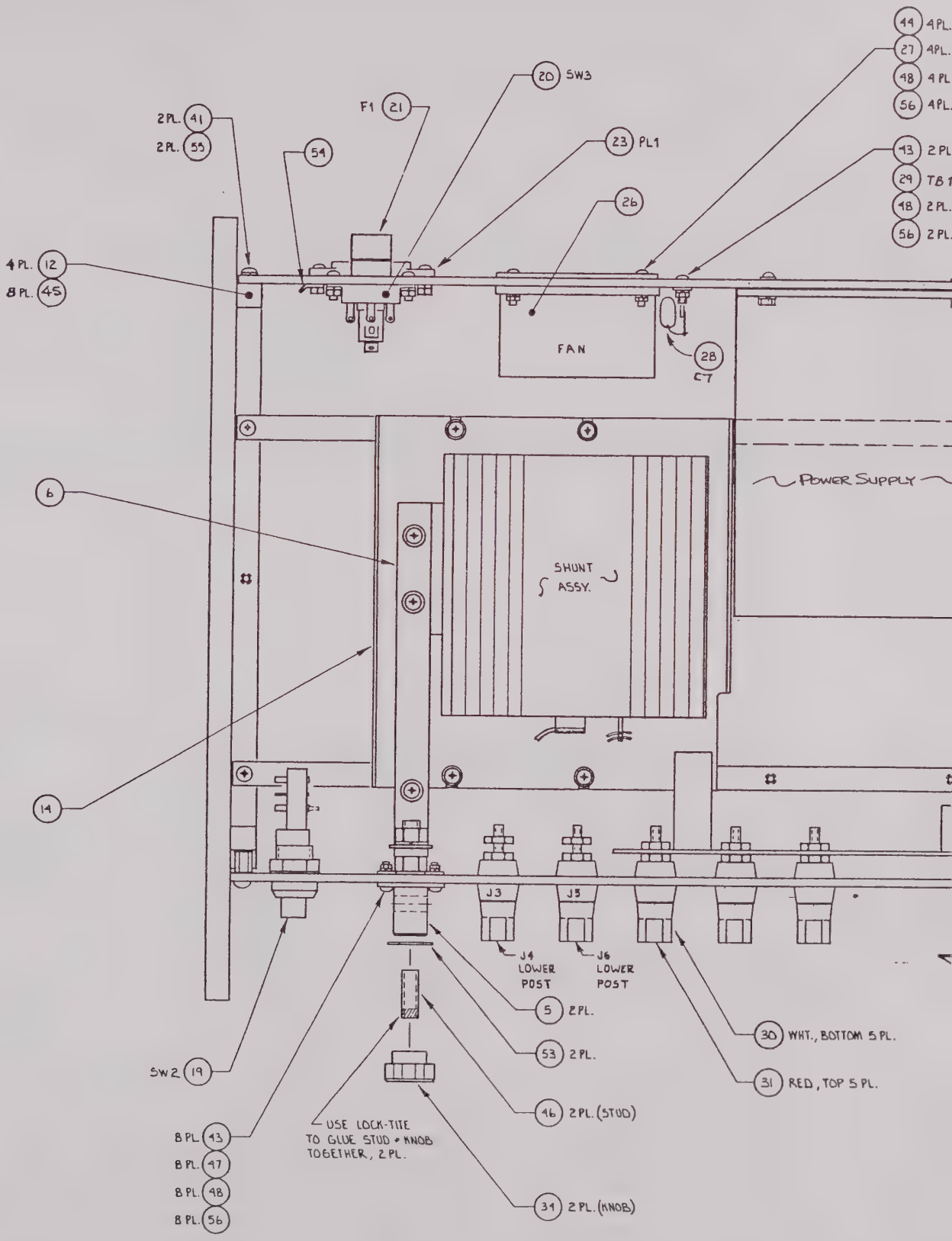
MAIN BD. ASSY.

SCALE	CODE IDENT	SIZE	DRAWING NO	REV
1:1	53504	C	2575-600	J

SHEET 3 OF 3

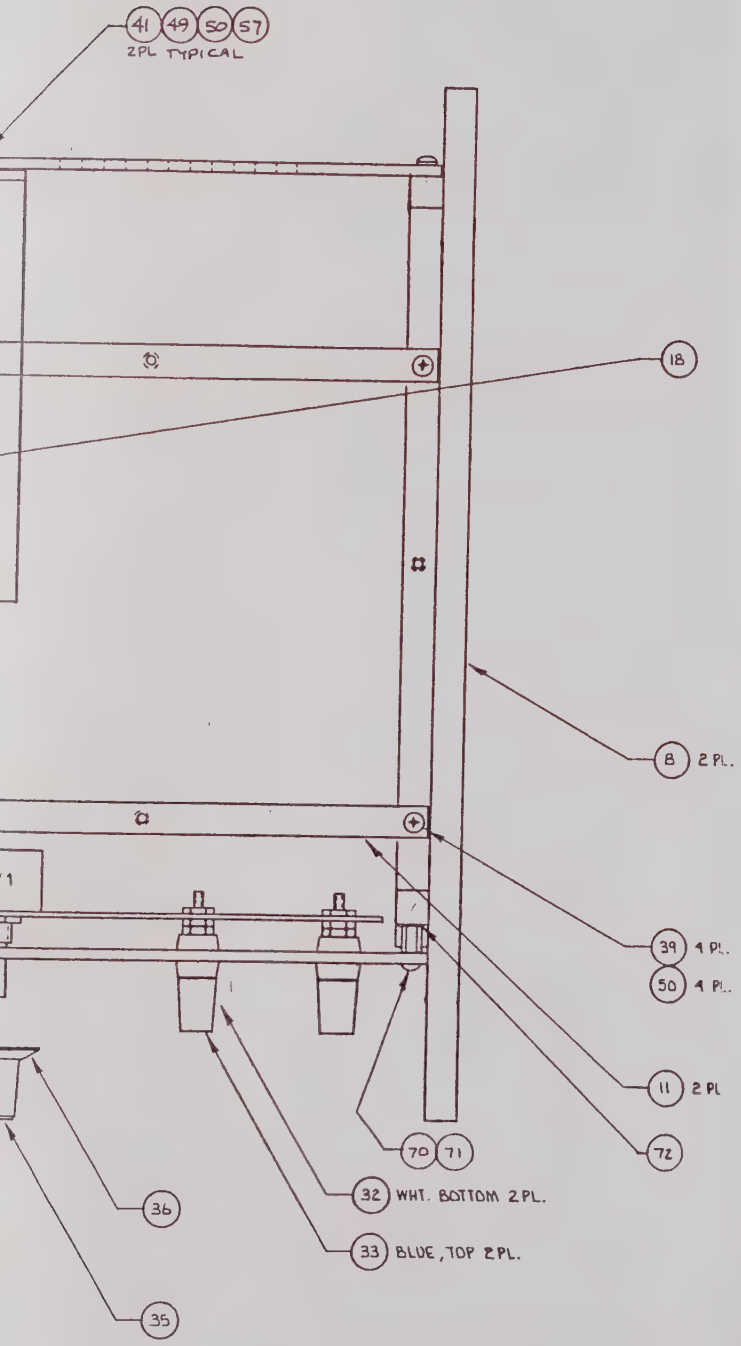
NOTES: (UNLESS OTHERWISE SPECIFIED)

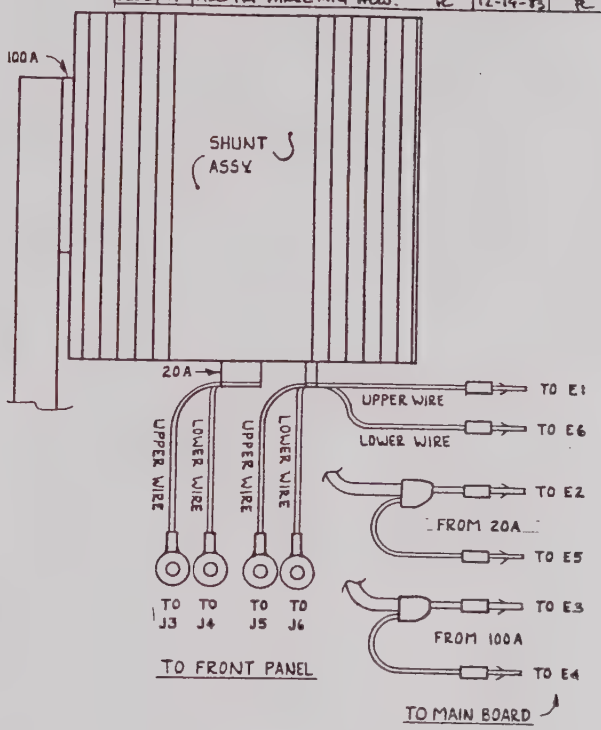


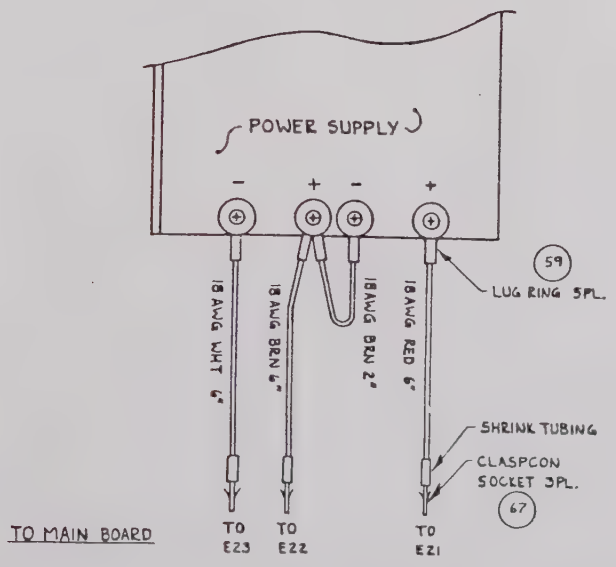
	H	DELETE (49) (50) ADD (45)	R	12-13-83

— SEE SHT. 5 OF 6 —

REVISIONS				
ECO	LTR	DESCRIPTION	DATE	APPROVED
	C	REDESIGNED 7-1-83 CRE		
0165	E	SEE ECR 0165 C.R.E	11-10-83	POW
0151	F	NEW SIDE RAIL WPW	11-22-83	POW
0183	G	CHANGE OF SHUNT WIRING WPW	12-6-83	POW
0206	H	ADD FET PANEL MTG HDW. R	12-19-83	R







DASH NO	QTY REQD	NEXT ASSEMBLY	USED ON

TOLERANCES
X = ± 30'
.XX = ± .03
.XXX = ± .010

MATERIAL

BREAK ALL SHARP CORNERS AND EDGES, MACH SURFACES 64

FINISH

DRAWN CRE	7/1/83	
CHECKED RJ	7-5-83	
APPR PJ	7-5-83	
STK NO		

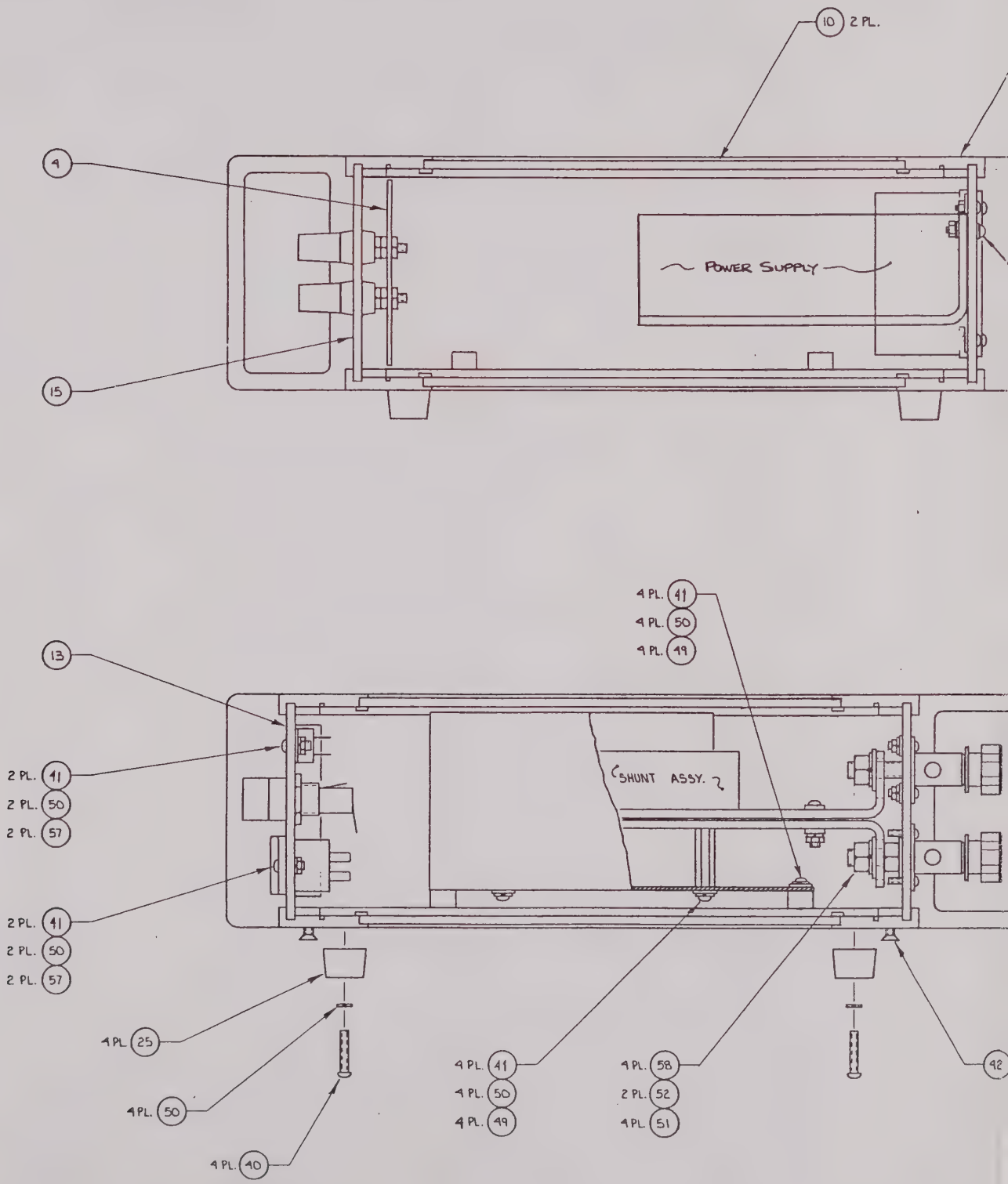
Valhalla Scientific Inc.
SAN DIEGO, CA

CHASSIS ASSY. (2575)

SCALE	CODE IDENT	SIZE	DRAWING NO	REV
1:1	53504	D	2575-400	H

SHEET 6 OF 6

TES: (UNLESS OTHERWISE SPECIFIED)



REVISIONS				
ECO	LTR	DESCRIPTION	DATE	APPROVED
	C	REDESIGNED 7-1-83 CRE		
0165	E	SEE ECR 0165 CRE	11-10-83	PW
0151	F	NEW SIDE RAIL WPW	11-22-83	PW
0183	G	CHANGED SHUNT WIRING W.P.W	12-6-83	PW
0206	H	MTG BLOCK ADD TO FRT PANEL R	12-19-83	R
386	I	PARTS LIST CHANGE RDN	3-21-84	RN
456	J	CHG P/S LOC. & HDWE R	5-18-84	R
708	K	CHG. LENGTH OF ITEM 45 TO 9/16"	4-16-85	JW

(9) 4 PL.

RIGHT SIDE VIEW

SOME PARTS NOT SHOWN

(41)
(49)
(50)
(57)

LEFT SIDE VIEW

SOME PARTS NOT SHOWN

2 PL.

DASH NO	QTY REQD	NEXT ASSEMBLY	USED ON

TOLERANCES

X = ± 30'
.XX = ± .03
.XXX = ± .010

BREAK ALL SHARP CORNERS AND EDGES, MACH SURFACES 64

MATERIAL

FINISH

DRAWN	CRE	7-1-83
CHECKED	RJ	7-5-83
APPR	PW	7-5-83
STK NO		

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Valhalla Scientific Inc.
SAN DIEGO, CA

CHASSIS ASSY. (2575)

SCALE	CODE IDENT	SIZE	DRAWING NO	REV
1:1	53504	D	2575 - 400	H

SHEET 5 OF 6

Federal Supply Codes for Manufacturers

00656
Aerovox Corp.
New Bedford, Massachusetts

00686
Film Capacitors, Inc.
Passaic, New Jersey

00779
AMP Inc.
Harrisburg, Pennsylvania

00853
Sangamo Electric Company
Pickens, South Carolina

01121
Allen-Bradley Co.
Milwaukee, Wisconsin

01255
Litton Industries, Inc.
Beverly Hills, California

01281
TRW Electronic Comp.
Semiconductor Operations
Lawndale, California

01295
Texas Instruments, Inc.
Dallas, Texas

01686
RCL Electronics Inc.
Manchester, New Hampshire

02114
Ferroxcube Corp.
Saugerties, New York

02131
General Instrument Corp.
Westwood, Maine

02799
Areo Capacitors, Inc.
Chatsworth, California

03508
General Electric Co.
Syracuse, New York

03797
Genisco Technology Corp.
Compton, California

03877
Transistron Electronic Corp.
Wakefield, Massachusetts

03911
Clairex Corp.
Mt. Vernon, New York

04009
Arrow Hart Inc.
Hartford, Connecticut

04217
Essex International Inc.
Anaheim, California

04222
AVX Corp.
Myrtle Beach, Florida

04423
Telonic Industries
Laguna Beach, California

04713
Motorola Inc.
Phoenix, Arizona

04946
Standard Wire & Cable
Los Angeles, California

05276
Pomona Electronics Co., Inc.
Pomona, California

05277
Westinghouse Electric Corp.
Youngwood, Pennsylvania

05397
Kemet, Union Carbide Corp.
New York, New York

05574
Viking Industries
Chatsworth, California

05820
Wakefield Engineering Inc.
Wakefield, Massachusetts

06001
General Electric Co.
Columbia, South Carolina

06383
Panduit Corp.
Tinley Park, Illinois

06473
Bunker Ramo Corp.
Chatsworth, California

06555
Beede Electrical Instrument Co.
Penacook, New Hampshire

06743
Clevite Corp.
Cleveland, Ohio

07088
Kelvin Electric Company
Van Nuys, California

07256
Silicon Transistor Corp.
Chelmsford, Massachusetts

07263
Fairchild Semiconductor
Mountain View, California

07344
Bircher Co., Inc.
Rochester, New York

07597
Burndy Corp.
Rochester, New York

07716
I R C Incorporated
Burlington, Iowa

07910
Teledyne Semiconductor
Hawthorne, California

08065
Accurate Rubber and Plastics Co.
San Diego, California

08261
Spectra Strip Corp.
Garden Grove, California

08530
Reliance Mica Corp.
Brooklyn, New York

08806
General Electric Co.
Cleveland, Ohio

09026
Babcock Electronics Corp.
Costa Mesa, California

09214
G. E. Co. Semi-Conductor
Auburn, New York

09353
C and K Components
Watertown, Massachusetts

09922
Burndy Corp.
Norwalk, Connecticut

09969
Dale Electronics Inc.
Yankton, S. Dakota

11236
CTS of Berne
Berne, Indiana

11403
Best Products Co.
Chicago, Illinois

11503
Keystone Columbia Inc.
Warren, Michigan

11532
Teledyne Relays
Hawthorne, California

11711
General Instrument Corp.
Hicksville, New York

12014
Chicago Rivet & Machine Co.
Bellwood, Illinois

12060
Diodes, Inc.
Chatsworth, California

12136
Philadelphia Handle Co.
Camden, New Jersey

12405
Hysol Corporation
El Monte, California

12406
Elpac, Incorporated
Fullerton, California

12615
U.S. Terminals Inc.
Cincinnati, Ohio

12617
Hamlin Inc.
Lake Mills, Wisconsin

12697
Clarostat Mfg. Co.
Dover, New Hampshire

12969
Unitrode Corp.
Watertown, Massachusetts

13103
Thermalloy Co., Inc.
Dallas, Texas

13327
Solitron Devices Inc.
Tappan, New York

13454
Texas Crystals
River Grove, Illinois

13511
Amphenol Cadre Div.
Los Gatos, California

13606
Use 56289
Sprague Electric Co.
Concord, New Hampshire

14099
Semtech Corp.
Newbury Park, California

14655
Cornell-Dublier Electronics
Newark, New Jersey

14752
Electro Cube Inc.
San Gabriel, California

14936
General Instrument Corp.
Hicksville, New York

15801
Fenwal Electronics Inc.
Framingham, Massachusetts

15818
Teledyne Semiconductors
Mountain View, California

15849
Useco Inc.
Van Nuys, California

15898
International Business
Machines Corp.
Essex Junction, Vermont

163?4
Replaced by 28478

16473
Cambridge Scientific Ind.
Cambridge, Maryland

16758
Delco Electronics
Kokomo, Indiana

17856
Siliconix, Inc.
Santa Clara, California

18324
Signetics Corp.
Sunnyvale, California

Federal Supply Codes for Manufacturers (cont.)

18612
Vishay Intertechnology Inc.
Malvern, Pennsylvania

18722
R C A
Mountaintop, Pennsylvania

18927
GTE Sylvania Inc.
Titusville, Pennsylvania

21604
Bucheye Stamping Co.
Columbus, Ohio

21845
Solitron Devices Inc.
Riveria Beach, Florida

22767
ITT Semiconductors
Palo Alto, California

23936
Pamotor Div.
Burlingham, California

24355
Analog Devices Inc.
Norwood, Massachusetts

24655
General Radio
Concord, Massachusetts

25088
Siemen Corp.
Isilen, New Jersey

25403
Amperex Electronic Corp.
Slatersville, Rhode Island

25684
Victoreen Instrument Co., Inc.
Oak Lawn, Illinois

27014
National Semiconductor Corp.
Santa Clara, California

27556
IMB Electronic Products
Santa Fe Springs, California

27264
Molex Products
Downers Grove, Illinois

28213
Minnesota Mining & Mfg. Co.
St. Paul, Minnesota

28480
Hewlett Packard Co.
Palo Alto, California

29083
Monsanto Co., Inc.
Santa Clara, California

29604
Stackpole Components Co.
Raleigh, North Carolina

30323
Illinois Tool Works, Inc.
Chicago, Illinois

30983
Electra/Midland
San Diego, California

32539
Mura Corp.
Great Neck, New York

32897
Erie Technological Products, Inc.
Carlisle, Pennsylvania

32997
Bourns Inc.
Riverside, California

33173
General Electric Co.
Owensboro, Kentucky

34333
Silicon General
Westminister, California

34335
Advanced Micro Devices
Sunnyvale, California

34802
Electromotive Inc.
Kenilworth, New Jersey

37942
P.R. Mallory & Co., Inc.
Indianapolis, Indiana

43543
Nytronics Inc.
Geneva, New York

44655
Ohmite Mfg. Co.
Skokie, Illinois

49671
RCA Corp.
New York, New York

49956
Raytheon Company
Lexington, Massachusetts

50088
Mostek Corp.
Carrollton, Texas

50579
Litronix Inc.
Cupertino, California

51605
Scientific Components Inc.
Linden, New Jersey

53021
Sangamo Electric Co.
Springfield, Illinois

53504
Valhalla Scientific, Inc.
San Diego, California

54294
Cutler-Hammer Inc.
Selma, North Carolina

55026
Simpson Electric Co.
Elgin, Illinois

56289
Sprague Electric Co.
North Adams, Massachusetts

58474
Superior Electric Co.
Bristol, Connecticut

63743
Ward Leonard Electric Co., Inc.
Mount Vernon, New York

65092
Weston Instruments Inc.
Newark, New Jersey

70563
Amperite Company
Union City, New Jersey

70903
Belden Corp.
Geneva, Illinois

71279
Cambridge Thermionic Corp.
Cambridge, Massachusetts

71400
Bussmann Mfg.
Saint Louis, Missouri

71450
CTS Corp.
Elkhart, Indiana

71468
ITT Cannon Electric Inc.
Santa Ana, California

71482
Clare, C.P. & Co.
Chicago, Illinois

71590
Centrelab Electronics
Milwaukee, Wisconsin

71707
Coto Coil Co., Inc.
Providence, Rhode Island

71744
Chicago Miniature Lamp Works
Chicago, Illinois

71785
TRW Electronics Components
Chicago, Illinois

72005
Wilber B. Driver Co.
Newark, New Jersey

72259
Nytronics Inc.
Pelham Manor, New Jersey

72619
Dialight Div.
Brooklyn, New York

72982
Erie Tech. Products Inc.
Erie, Pennsylvania

73138
Bechman Instrument Inc.
Helipot Division
Fullerton, California

73445
Amperex Electronic Corp.
Hicksville, New York

73734
Federal Screw Products, Inc.
Chicago, Illinois

73899
JFD Electronics Co.
Brooklyn, New York

73949
Guardian Electric Mfg. Co.
Chicago, Illinois

74276
General Instrument Corp.
Neptune, New Jersey

74306
Piezo Crystal Co.
Carlisle, Pennsylvania

74970
Johnson E.F., Co.
Waseca, Minnesota

75042
TRW Electronics Components
IRC Fixed Resistors
Philadelphia, Pennsylvania

75378
CTS Knights Inc.
Sandwich, Illinois

75382
Kulka Electric Corp.
Mount Vernon, New York

75915
Littlefuse Inc.
Des Plaines, Illinois

76055
Mallory Controls
Frankfort, Indiana

76493
J.W. Miller Company
Los Angeles, California

76854
Oak Industries Inc.
Crystal Lake, Illinois

77342
Potter & Brumfield Div.
Princeton, Indiana

77638
General Instrument Corp.
Rectifier Division
Brooklyn, New York

78488
Stackpole Carbon Co.
Saint Marys, Pennsylvania

78553
Eaton Corp.
Cleveland, Ohio

80031
Electro-Midland Corp.
Mepco Div.
Norristown, New Jersey

56289
Sprague Products
North Adams, Massachusetts

80294
Bourns Inc., Instrument Div.
Riverside, California

81073
Grayhill, Inc.
La Grange, Illinois

Federal Supply Codes for Manufacturers (cont.)

81095
Triad Transformer Corp.
Venice, California

81312
Winchester Electronics
Div. of Litton Industries Inc.
Oakville, Connecticut

81483
International Rectifier Corp.
Los Angeles, California

81741
Chicago Lock Co.
Chicago, Illinois

82389
Switchcraft Inc.
Chicago, Illinois

82877
Rotron Inc.
Woodstock, New York

82879
ITT Royal Electric Div.
Pawtucket, Rhode Island

83003
Varo Inc.
Garland, Texas

83298
Bendix Corp.
Eatontown, New Jersey

83330
Herman H. Smith, Inc.
Brooklyn, New York

83594
Burroughs Corp.
Plainfield, New Jersey

83740
Union Carbide Corp.
New York, New York

84171
Arco Electronics
Great Neck, New York

84411
TRW Electronic Components
Ogallala, Nebraska

84613
Fuse Indicator Corp.
Rockville, Maryland

84682
Essex International Inc.
Peabody, Massachusetts

86684
Radio Corp. of America
Harrison, New Jersey

88219
Gould Inc.
Trenton, New Jersey

88245
Litton Systems Inc.
Useco Div.
Van Nuys, California

88419
Cornell-Dubilier Electronic Div.
Fuquay-Varian, North Carolina

89730
G.E. Co.
Newark, New Jersey

90201
Mallory Capacitor Co.
Indianapolis, Indiana

56365
Square D Co.
Chicago, Illinois

90303
Mallory Battery Co.
Tarrytown, New York

91094
Essex International Inc.
Newmarket, New Hampshire

91293
Johanson Mfg. Co.
Boonton, New Jersey

91506
Augat Inc.
Attleboro, Massachusetts

91637
Dale Electronics Inc.
Columbus, Nebraska

91662
Elco Corp.
Willow Grove, Pennsylvania

71468
Gremar Mfg. Co., Inc.
ITT Cannon/Gremar
Santa Ana, California

91802
Industrial Devices, Inc.
Edgewater, New Jersey

91833
Keystone Electronics Corp.
New York, New York

91929
Honeywell Inc.
Micro Switch Div.
Freeport, Illinois

92194
Alpha Wire Corp.
Elizabeth, New Jersey

93332
Sylvania Electric Products
Woburn, Massachusetts

94988
Wagner Electric Corp.
Tung-Sol Div.
Newark, New Jersey

95146
Alco Electronic Products Inc.
Lawrence, Massachusetts

95275
Vitramon Inc.
Bridgeport, Connecticut

95303
RCA Corp.
Receiving Tube Div.
Cincinnati, Ohio

95348
Gordo's Corp.
Bloomfield, New Jersey

95712
Bendix Corp.
Franklin, Indiana

97913
Industrial Electronic
Hardware Corp.
New York, New York

97945
Penwalt Corp.
SS White Industrial Products Div.
Piscataway, New Jersey

98278
Malco A. Microdot Co., Inc.
Connector & Cable Div.
Pasadena, California

98291
Sealectro Corp.
Mamaroneck, New York

98388
Royal Industries
Products Div.
San Diego, California

98978
IERC
Burbank, California

99120
Plastic Capacitors, Inc.
Chicago, Illinois

99217
Bell Industries Elect.
Burbank, California

99392
STM
Oakland, California

99515
ITT Jennings Monrovia Plant
Monrovia, California

99779
Use 29587
Bunker-Ramo Corp.
Landsdowne, Pennsylvania

99942
Centrelab Semiconductor
El Monte, California

VALHALLA SCIENTIFIC 2575A
CALIBRATION ID #_____

DATE_____ CODE # _____ TECH. _____

REFERENCE VALHALLA SCIENTIFIC MODEL 2575A MANUAL (PAGES 2 TO 3)

STEP 1 CHECK THEN ADJUST **RV1** 100A RANGE (STEP 1,2 AND 3)

BEFORE ADJUSTING _____ AFTER ADJUSTING _____

STEP 2 CHECK THEN ADJUST **RV2** 10 A RANGE (STEP 4 AND 5)

BEFORE ADJUSTING _____ AFTER ADJUSTING _____

STEP 3 CHECK THEN ADJUST **RV3** 1 A RANGE (STEP 6 AND 7)

BEFORE ADJUSTING _____ AFTER ADJUSTING _____

STEP 4 CHECK THEN ADJUST **RV4** .1 A RANGE (STEP 8 AND 9)

BEFORE ADJUSTING _____ AFTER ADJUSTING _____

STEP 5 CHECK THEN ADJUST **RV5** 10 mA RANGE (STEP 10 AND 11)

BEFORE ADJUSTING _____ AFTER ADJUSTING _____

STEP 6 CHECK THEN ADJUST **RV6** 1 mA RANGE (STEP 12 AND 13)

BEFORE ADJUSTING _____ AFTER ADJUSTING _____

STEP 7 REPEAT THE ABOVE SEQUENCE AT 1 KHz FOR THE 100A AND 10A RANGES AND 10 KHz FOR 1 mA THROUGH THE 10 A RANGES TO VERIFY AC PERFORMANCE .

STEP 8 SELECT EXT POSITION AND APPLY 100mV $\pm$ 5 uV TO AMPLIFIER INPUT TERMINALS. MONITOR OUTPUT AND ADJUST **RV7** FOR A READING OF 1.0000V $\pm$ 100 uV.

BEFORE ADJUSTING _____ AFTER ADJUSTING _____

2/24/98 PT

VALHALLA SCIENTIFIC 2575A CALIBRATION

ID # V08113

DATE 10-20-86 CODE # B TECH. John 23

REFERENCE VALHALLA SCIENTIFIC MODEL 2575A MANUAL (PAGES 2 TO 3)

STEP 1 CHECK THEN ADJUST **RV1** 100A RANGE (STEP 1,2 AND 3)

BEFORE ADJUSTING 99.962mV AFTER ADJUSTING NA

STEP 2 CHECK THEN ADJUST **RV2** 10 A RANGE (STEP 4 AND 5)

BEFORE ADJUSTING 99.949mV AFTER ADJUSTING 100.00 mV

STEP 3 CHECK THEN ADJUST **RV3** 1 A RANGE (STEP 6 AND 7)

BEFORE ADJUSTING 99.979 AFTER ADJUSTING 100.00 mV

STEP 4 CHECK THEN ADJUST **RV4** .1 A RANGE (STEP 8 AND 9)

BEFORE ADJUSTING 100.001mV AFTER ADJUSTING NA.

STEP 5 CHECK THEN ADJUST **RV5** 10 mA RANGE (STEP 10 AND 11)

BEFORE ADJUSTING 99.992mV AFTER ADJUSTING NA.

STEP 6 CHECK THEN ADJUST **RV6** 1 mA RANGE (STEP 12 AND 13)

BEFORE ADJUSTING 100.001mV AFTER ADJUSTING NA

STEP 7 REPEAT THE ABOVE SEQUENCE AT 1 KHz FOR THE 100A AND 10A RANGES AND 10 KHz FOR 1 mA THROUGH THE 10 A RANGES TO VERIFY AC PERFORMANCE .

STEP 8 SELECT EXT POSITION AND APPLY 100mV ± 5 uV TO AMPLIFIER INPUT TERMINALS. MONITOR OUTPUT AND ADJUST **RV7** FOR A READING OF 1.0000V ± 100 uV.

BEFORE ADJUSTING .9999V AFTER ADJUSTING 1.00000

87599